

- A1
- (1) receiving an EM input signal;
 - (2) generating a control signal having a plurality of pulses that are phase-shifted relative to a reference phase; and
 - (3) sampling the EM signal according to said control signal, resulting in a frequency translated EM signal that is phase shifted according to said phase shift of said pulses of said control signal.
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8. (Once Amended) A method of down-converting and phase shifting an EM signal, the method comprising the steps of:

- A2
- (1) receiving an EM input signal;
 - (2) generating a control signal having a plurality of pulses that are phase-shifted relative to a reference phase;
 - (3) sampling the EM signal according to said control signal, resulting in undersamples that are phase shifted according to said phase shift of said pulses of said control signal; and
 - (4) integrating successive undersamples, resulting in a down-converted output signal that is phase shifted according to said pulses of said control signal.
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24. (Once Amended) A method of up-converting and phase shifting a baseband signal, the method comprising the steps of:

- A3
- (1) receiving an EM input signal;
 - (2) generating a control signal having a plurality of pulses that are phase-shifted relative to a reference phase; and
 - (3) sampling the EM signal according to said control signal, resulting in a plurality of harmonic images that are each representative of the baseband signal, and are phase shifted according to said phase shift of said pulses in said control signal;
- wherein said control signal has pulse widths.
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A4

30. (Once Amended) A system for frequency translating an EM signal to generate a frequency translated output signal that is phase shifted relative to a reference phase, comprising:

a4
a pulse generator that is controlled by an LO signal, wherein said pulse generator triggers and generates a pulse when said LO signal exceeds a threshold;

a switch module controlled by pulses from said pulse generator, wherein said switch module samples said EM signal according to said pulses, resulting in said frequency translated output signal; and

means for varying a time that said LO signal exceeds said threshold of said pulse generator, and thereby phase shifting said frequency translated output signal;

wherein said pulses have pulse widths.
